REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. Restriction requirement.

The Examiner has determined that the application contains claims directed to patentably distinct inventions, that is Group I (Claims 1-58) and Group 2 (Claim 59). Accordingly, election has been required.

In response, the Applicants confirm the telephone election made on October 4, 2005, during which Group 1 (Claims 1-58) was elected. The Applicant confirms its election without traverse and cancels Claim 59 without prejudice and reserves right to pursue patent protection for this invention in a subsequently filed application.

2. Allowable Subject Matter

Claims 14-23, 26-31 and 58 have been allowed. Claims 6, 7, 9, 10, 38, 40, 41, 45-50 and 52-57, have been indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. Accordingly, Applicants have amended claim 45 to include all the limitations of base Claim 44, and thus Claim 45 (and Claims 46-50 dependent therefrom), are in condition for allowance. In addition, claim 52 has been amended to include all the limitations of base Claim 51, and thus Claim 52 (and Claims 53-57 dependent therefrom), are in condition for allowance.

Furthermore, newly added Claims 60 (having limitations of allowable Claim 6 and base claim), 61 (having limitations of allowable Claim 7 and base claim), 62 (having limitations of allowable Claim 9 and base claim), 63 (having limitations of allowable Claim 10 and base claim), 64 (having limitations of allowable Claim 37 and base claim), 65 (having limitations of allowable Claim 38 and base claim), 66 (having limitations of allowable Claim 40 and base claim), and 67 (having limitations of allowable Claim 41 and base claim) are in condition for allowance.

In addition, Claims 24 and 25, having been corrected for informalities under 35

U.S.C. §112, second paragraph, are also in condition for allowance.

3. Objection to Specification.

The specification was objected to for various informalities. Paragraphs [0053], [0074] and [0078] have been amended to correct the cited informalities. Therefore, this objection is now mute.

4. Rejection of Claims 4, and 42 under 35 U.S.C. §112, first paragraph

Claims 4 and 42 were rejected under 35 U.S.C. §112, first paragraph as allegedly failing to comply with the enablement requirement. In particular, page 3 of the Office Action states that the "specification does not describe a working gas which comprises a mixture and is also an element." Applicants respectfully disagree. Paragraph [0012] of the application states that the "working gas within the chamber volume is preferably argon or xenon, or other gas mixture exhibiting a high stopping power for charged particles." The above statement does not imply that the working gas be a homogenous solution, or that other gases cannot be mixed with argon or xenon as a "gas mixture." Furthermore, Claims 4 and 42 have been amended to recite a "gas" rather than a "gas mixture." Thus, the rejection of Claims 4 and 42 under 35 U.S.C. §112, first paragraph, however improper, is now mute.

5. Rejection of Claims 13, 24, 25, 37, and 39 under 35 U.S.C. §112, second paragraph.

Claims 13, 24, 25, 37 and 39 were rejected under 35 U.S.C. §112, second paragraph as being indefinite.

(a) In Claim 13, the Examiner found the limitation "said processing electronics" to have insufficient antecedent basis. Claim 13 has been amended to now depend from Claim 12, which establishes the processing electronics.

(b) In Claim 24, the Examiner found the limitation "said cover" to have insufficient antecedent basis. Claim 24 has been amended to recite "said top cover," which is established in base Claim 14.

(c) In Claims 37 and 39, the Examiner found the limitation "said housing" to have insufficient antecedent basis. Claims 37 and 39 have been amended to recite "said plastic housing," which is established in base Claim 33.

6. Rejection of Claims 1-5, 8, 11-13, 32-37, 39, 42-44 and 51 under 35 U.S.C. § 103(a).

Claims 1-5, 8, 11-13, 32-37, 39, 42-44 and 51 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Bersin et al. (U.S. No. 2,968,726) in view of one or more of Kantor (U.S. No. 3,654,469), Menlove et al. (U.S. No. 6,426,504), Goodings (G.B. 1,183,718) or Reber et al (U.S. No. 2004/0262530).

a. Rejection of Claims 1, 5, 8, 11 and 12

Claims 1, 5, 8, 11 and 12 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable under Bersin et al. and Kantor. Such rejection is traversed in part and overcome in part as follows.

Currently amended Claim 1 recites, among other elements, a detector for detecting neutrons and gamma radiation having at least one cathode, a plastic housing surrounding the cathode, and at least one plastic lid attached to the housing. In particular, the plastic housing functions as both a structural component and a moderator of neutrons. Support for the amendments to Claim 1 may be found in paragraphs 16, 52, and FIGS. 1-4 of the originally filed Application.

The above recited elements of Claim 1 are not found in the recited art. The Bersin et al. device is an ionization chamber that operates in DC current mode, and has a steel wall or cylinder 17 of predetermined wall thickness to contain hydrogen gas at high pressure (see col. 3, lines 62-64, col. 5 lines 20-24, and FIG. 3). Because the Bersin et al. device operates in DC current mode, it has low sensitivity and cannot distinguish between neutron and gamma signals.

The Kantor device, on the other hand, is a x-ray detector that uses a proportional counter (see col. 1, lines 42-45, and col. 2, lines 55-57). It is well established in the art that proportional counters rely on gas multiplication gain to perform detection. Because of the inherent gas multiplication process, it is also well known in the art that plastic materials are not used in proportional counters, particularly as a structural component, because of severe aging problems due to polymerization and deposition of outgassing products on the anode wire (see Application, paragraphs [0008] and [0016]). Therefore, the working gas in such units is permanently sealed within the detection volume, e.g. via a metallic structural component. This is evident in the Kantor device, as the chamber is made up of a metallic base portion 33 and walls 23 (see col. 2, lines 1-5, and FIGS. 1 and 2). Furthermore, the Mylar housing 32 does not act as a moderator, as this would be prohibitive in proportional counters, and actually acts as a window to admit radiation into the detector (see col. 2, lines 5-9).

The detector of the present invention has an ionization chamber operating in pulse mode for the detection of neutrons and DC mode for the detection of gammas. This novel configuration, along with the use of lithium as a neutron getter obviates the reliance on gas multiplication gain. The detector is thus less impacted by gas impurities thereby allowing the use of materials and construction (e.g. plastic) that are not suited for proportional or DC current counters (see Application, paragraph [0016]). Therefore, neither the Bersin et al. nor Kantor references teach or suggest use of a plastic housing as both a structural element and moderating material, and rejection of Claim 1 under §103(a) is improper.

Claims, 5, 8, 11 and 12, being dependent from allowable base Claim 1, are now in condition for allowance. In addition, these claims recite additional elements not found in the cited art. For example, currently amended Claim 5 recites a conductive neutron-capturing layer that is chosen from the group consisting essentially of lithium-6 (6Li), or a lithium-6 compound. Use of 6Li as a neutron-capturing layer is not taught nor suggested in any of the cited references.

Furthermore, Claim 12 recites processing electronics are configured to operate said anode in pulse mode for the detection of neutrons and DC mode for the detection of gammas. As explained above, the Bersin et al. device operates solely in DC mode, and the Kantor device is a proportional counter. Thus neither of the above references teach the recited elements of Claim 12.

b. Rejection of Claims 2-4 and 13

Claims 2-4 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable under Bersin et al., Kantor, and either Menlove et al., Goodings or Reber et al. Because Claims 2-4 depend from allowable base Claim 1, this rejection is now moot. In addition, with respect to the rejection of Claims 2 and 3, the Menlove et al. device is also a proportional counter. Therefore, the Menlove et al. reference does not teach or suggest a HDPE housing that functions as a structural member and moderator. Hence, claims 2-4 and 13 are in condition for allowance.

c. Rejection of 32-36, 39, 42-44 and 51

Claims 32-36, 39, 42-44 and 51 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable under Bersin et al. in view of one or more of Kantor, Menlove et al., Goodings or Reber et al. Such rejections are overcome as follows.

Amended Claim 32 recites, among other elements, a detector for detecting neutrons and gamma radiation having a plastic housing surrounding a cathode, wherein the plastic housing is configured to function as a structural component and a moderator of neutrons. Amended Claims 51 similarly recites, among other elements, a method for detecting neutrons and gamma radiation having the steps of providing a plastic housing surrounding a cathode, wherein the plastic housing is configured to function as a structural component and a moderator of neutrons. As discussed above with respect to Claim 1, none of the cited references teach or suggest the above elements. Thus, the rejection of Claims 32 (and dependent Claims 34-36, 39) and 51 is improper.

7. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, Applicants have made these amendments in order expedite allowance of the currently pending subject matter. However, Applicants do not acquiesce in the original ground for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments. Applicants reserve the right to pursue the original scope of these claims in the future, such as through continuation practice, for example.

8. Conclusion.

Based on the foregoing, Applicants respectfully request that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present Application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, Applicants respectfully request that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

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Respectfully submitted,

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